Applicants' claims require a chemical bond between the abrasive grain and the substrate, **in combination with all oth r l m nts** of the claimed invention. The tool defined in independent claims 1 and 28 is much more than just a tool made with chemically bonded abrasive grain or just a tool having a negative rake angle cutting surface.

The particular geometry of teeth having an initial layer and successive ring shaped layers of single layer diamond grains which is critical to the claimed tool performance is neither disclosed nor suggested in the cited patents.

A negative rake design is an optional element of Applicants' invention, recited only in claims 3-4, 10, 14-16, 28-29 and 34. Claims 1, 5-9, 11-13, 17-26 and 33 do not incorporate a negative rake angle as an essential element of the tool needed to yield a freer cut, longer tool life and maximum use of diamond grain. Thus, Scott's disclosure of a negative rake angle in the cutting elements of the tool chain is not relevant to claim 1 and claims 5-9, 11-13, 17-26 and 30-33.

Further, Applicants' tools may be operated in either rotational direction without loss of performance. This is not true of the cutting chains of Scott which are very likely to come unraveled if operated in a positive rake direction. Lastly, by emphasizing the benefits and the criticality of a negative rake design, Scott's disclosures actually teach away from the notion that a variety of tooth angles and geometries, as defined in Applicants' claim 1, share such benefits.

With respect to claim 28 and all other claims which include a negative rake angle limitation, Scott fails to suggest a cutting tool wherein "each cutting level on each tooth being oriented such that a portion of each cutting level overlaps at least a portion of each other cutting level of the tooth" on a monolithic substrate. Scott's successive rows of grains (in contrast to the successive rings of grain as recited in claim 28) provide no undercut

protection and no side relief for free rotation of the tool. Relative to a ring of grain, the row of grain yields larger chip thicknesses and a less uniform cut into the workpiece. Even in the circular saw design (suggested at col. 8, lines 16-18 of Scott), the Scott cutting elements would display an increase in power draw, less free cut and decreased tool life relative to the tools of the invention.

The limited role of negative rake design in the benefits achieved by Applicants' tools is established by the data submitted herewith in the second declaration of inventor Buljan. It can be seen that a single row of diamond grain bonded to the leading edge of negative rake teeth by a chemically reactive braze, lacks the tool life and other benefits achieved with a ring of diamond grain on an equivalent tool under identical test conditions. The data in the second Buljan declaration evidence a similar conclusion for the electroplated tools of Asada.

For these reasons, Scott's design cannot yield the combined benefits of high cutting rate, high penetration rate, long steady state cutting conditions, and long tool life observed with the chemically bonded grain and monolithic core and tooth geometry designs specified for the tools of Applicants' invention. The Scott tools tested were made with improved designs relative to those disclosed in the patents, yet still did not perform as well as the claimed tools. The negative rake was measured with a chemically reactive braze on a monolithic substrate, rather than the non-reactive bond and mesh and non-monolithic substrate Scott teaches.

Further, notwithstanding the Examiner's comments, Asada does not teach a tooth design having "an initial cutting level" as set forth in Applicants' claims. Asada teaches the removal of the uppermost layer of diamond on the perimeter of the teeth prior to use of the tool (see, e.g., col. 2, lines 10-22, of Asada). Additionally, it is not clear that Asada

achieves a single layer of diamond abrasive grain on the teeth, as electroplating tends to unevenly deposit areas having multiple layers of grain on the substrate surface, along with areas having single layers of grain.

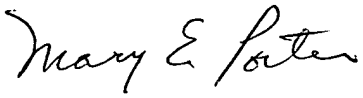
Lowder is silent with respect to tool geometry and thus adds nothing to the design deficiencies of Scott and Asada.

For these reasons, Applicants' invention is not obvious over the contents of the cited patents.

CONCLUSION

In view of the Declaration and Remarks submitted herein, Applicants respectfully request reconsideration of the rejection and an allowance of the claims.

Respectfully submitted,



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